UNITED STATES PATENT AND TRADEMARK OFFICE

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EXAMINER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>28 March 2007</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>21-26,38-48,50-56,68 and 80-86</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>21-26,38-48,50-56,68 and 80-86</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>28 March 2007</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

This Office Action is responsive to the amendment filed on 28 March 2007 in application # 10/694115.

Claims 1-20, 27-37, 49, 57-67, 69-79, and 87-91 have been cancelled.

Claims 21-26, 38-48, 50-56, 68, and 80-86 are pending and have been presented for examination.

Response to Arguments

Applicant's arguments with respect to claims 21-26, 38-48, 50-56, 68, and 80-86 have been considered but are moot in view of the new ground(s) of rejection.

Drawings

The drawings were received on 28 March 2007. These drawings are acceptable.

Specification

The amendments to the specification received on 28 March 2007 are acceptable and have been entered.

Claim Objections

Claims 50 and 80 are objected to because of the following informalities: the claims recite a series of steps, however, there are two steps labeled as step "d" and there is not step labeled step "b". Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 21-26 are rejected under 35 U.S.C. 102(e) as being anticipated by Liu et

al (U.S. Patent Application Publication #2005/0005044).

As per claim 21: Liu discloses a virtualization switch for performing a plurality of

virtualization services within a data path said virtualization switch comprises: a network

interface (NI) (see [0050]); an iSCSI module (see [0050]); a target manager (TM) (see

[0051]); a volume manager (VM) capable of translating a logic command to a list of

physical commands (see [0055]), wherein said physical commands are constructed in a

data structure, said data structure defines the relations between said physical

commands (see [0081]); a data transfer arbiter (DTA) (see [0065]); a device manager

(DM) (see [0045]); a plurality of input ports to receive incoming packets from a network

(see [0045]); and, a plurality of output ports to communicate with plurality of storage

devices (see [0045]).

As per claim 22: said data structure comprises at least a pointer to said storage

device (see [0081]).

As per claim 23: said alternative command link links between at least two physical commands that can be executed in parallel (see [0087]-[0088], *the system uses a RAID configuration, therefore, it is inherent that there is a data structure that indicates what commands can be executed in parallel to fully utilize the increased throughput that a RAID system provides*).

As per claim 24: said VM further comprises a mapping schema used for translating said logic command to said list of physical commands (see [0055]).

As per claim 25: said mapping schema defines relations between virtual volumes, logical units, and said storage devices (see [0046] and [0055], *it is inherent that the device would map between logical units and physical storage devices since the storage devices that are presented to the host are virtual*).

As per claim 26: said virtual volume is at least one of: stripe volume, or mirrored volume (see [0046]).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 38-48 and 68 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liu et al (U.S. Patent Application Publication #2005/0005044) in view of Kobayashi

et al (U.S. Patent #7,219,151) and Edsall et al (U.S. Patent Application Publication #2003/0172149).

As per claim 38: Liu discloses a method for performing a plurality of virtualization services, said method being further operative to perform said virtualization services within a data path, said method comprises the steps of: receiving a logic command to be performed on at least one virtual volume, said logic command including at least a virtual address (see [0045]); scheduling said logic command for execution (see [0053]), wherein said logic command is at least a SCSI command comprising the steps of: receiving said logic command from said initiator host (see [0045]); parsing said logic command to determine at least said virtual address and said logic commands type (see [0051]); performing a check to determine is said logic command is valid (see [0085]); generating a response if said logic command is invalid, (see [0079]); and generating a data transfer request (see [0079]); translating, in one pass, said logic command to a list of physical commands (see [0051]-[0053]), wherein each of said physical command is targeted to a different storage device (see [0047], *when the storage devices are set up as a mirror, there would be one write command that is sent to each drive that makes up the mirror*); determining the amount of data to be transferred via a network (see [0081]); and, executing said physical commands on said storage devices (see [0084]). Liu fails to disclose determining if said initiator host is authorized to send said logic command, and denying the logic command if the host is unauthorized. Kobayashi discloses authenticating an iSCSI initiator to determine if the initiator is authorized to issue the logic command (see column 9, lines 14-40). If the initiator is not approved, the logic

command is denied (see column 9, lines 41-47). Performing authentication based on

the logic command and logical units is advantageous because the user is not tied down

to a specific computer at a specific location, and management of the access right is

much easier (see column 2, lines 32-41). It would have been obvious to a person

having ordinary skill in the art to which said subject matter pertains to have modified the

system disclosed by Liu to add authentication, as disclosed by Kobayashi, to make

management of the storage system easier, and to allow the user to use a computer in

any location, and not have to be tied to a specific location, as disclosed by Kobayashi.

The combination of Liu and Kobayashi still fail to disclose adding the logic command to

a host-LU queue. Edsall discloses storing frames that are going to be transmitted to the

storage devices in a queue (see [0059]). Storing the packets in a queue as opposed to

directly transmitting them to the storage device allows the storage network to implement

a quality of service (see [0059]). It would have been obvious to a person having

ordinary skill in the art to which said subject matter pertains to have modified the

combination of Liu and Kobayashi, to include a queue to store the packets that are

going to be sent to the storage devices, as disclosed by Edsall, to allow the system to

implement a quality of service guarantee.

As per claim 39: the combination discloses said response command comprises

and iSCSI service response code indicating the type of generated error (see Liu [0050],

since the system uses the iSCSI protocol, it is inherent that the response would be in

the form of an iSCSI service response code).

As per claim 40: the combination discloses said host-LU queue comprises logic commands requested to be executed by said host on said LU (see Edsall [0058]-[0059]).

As per claim 41: the combination discloses selecting said logic command to be executed from said host-LU queue (see Edsall [0059], *since all the commands are buffered in the queue, it is inherent that the command would be selected from the queue to be executed*).

As per claim 42: the combination discloses a selection using a weighted round robin (see Edsall [0059]-[0060], *there are multiple queue to choose the instruction from, since there is a quality of service issue, the packets in the higher priority queue will be weighted heavier to be chosen first*).

As per claim 43: the combination discloses said command type is a read command (see Liu [0052]).

As per claim 44: the combination discloses said amount of data to be transferred is determined by an available space parameter (see Liu [0081]).

As per claim 45: the combination discloses said available space parameter defines the number of data bytes to be sent to the host (see Liu [0081]).

As per claim 46: the combination discloses accessing a storage device using a physical address (see Liu [0055]); retrieving from said accesses storage device the number of bytes designated in said available space parameter (see Liu [0052] and [0081]); sending the retrieved data to said host (see Liu [0052]); and repeating said steps until all data is read from said storage device (see Liu [0052], *it is inherent the*

system would continue reading the data off of the storage device and sending it to the host until all the data is retrieved).

As per claim 47: the combination discloses said physical commands are executed in parallel (see Liu [0048]).

As per claim 48: the combination discloses said command type is a write command (see Liu [0053]).

As per claim 68: Liu discloses computer executable code for performing a plurality of virtualization services stores on a recordable media, said computer executable code being further operative to perform said virtualization services within a data path, said code comprises the steps of: receiving a logic command to be performed on at least one virtual volume, said logic command including at least a virtual address (see [0045]); scheduling said logic command for execution (see [0053]), wherein said logic command is at least a SCSI command comprising the steps of: receiving said logic command from said initiator host (see [0045]); parsing said logic command to determine at least said virtual address and said logic commands type (see [0051]); performing a check to determine is said logic command is valid (see [0085]); generating a response if said logic command is invalid, (see [0079]); and generating a data transfer request (see [0079]); translating, in one pass, said logic command to a list of physical commands (see [0051]-[0053]), wherein each of said physical command is targeted to a different storage device (see [0047], *when the storage devices are set up as a mirror, there would be one write command that is sent to each drive that makes up*

the mirror); determining the amount of data to be transferred via a network (see [0081]);

and, executing said physical commands on said storage devices (see [0084]). Liu fails

to disclose determining if said initiator host is authorized to send said logic command,

and denying the logic command if the host is unauthorized. Kobayashi discloses

authenticating an iSCSI initiator to determine if the initiator is authorized to issue the

logic command (see column 9, lines 14-40). If the initiator is not approved, the logic

command is denied (see column 9, lines 41-47). Performing authentication based on

the logic command and logical units is advantageous because the user is not tied down

to a specific computer at a specific location, and management of the access right is

much easier (see column 2, lines 32-41). It would have been obvious to a person

having ordinary skill in the art to which said subject matter pertains to have modified the

system disclosed by Liu to add authentication, as disclosed by Kobayashi, to make

management of the storage system easier, and to allow the user to use a computer in

any location, and not have to be tied to a specific location, as disclosed by Kobayashi.

The combination of Liu and Kobayashi still fail to disclose adding the logic command to

a host-LU queue. Edsall discloses storing frames that are going to be transmitted to the

storage devices in a queue (see [0059]). Storing the packets in a queue as opposed to

directly transmitting them to the storage device allows the storage network to implement

a quality of service (see [0059]). It would have been obvious to a person having

ordinary skill in the art to which said subject matter pertains to have modified the

combination of Liu and Kobayashi, to include a queue to store the packets that are

going to be sent to the storage devices, as disclosed by Edsall, to allow the system to

implement a quality of service guarantee.

Claims 50-56 and 80-86 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Liu et al (U.S. Patent Application Publication #2005/0005044) in view

of Edsall et al (U.S. Patent Application Publication #2003/0172149).

As per claim 50: Liu discloses a method for performing a plurality of virtualization

services, said method being further operative to perform said virtualization services

within a data path, said method comprises the steps of: receiving a logic command to

be performed on at least one virtual volume, said logic command including at least a

virtual address (see [[0044] and [0051], *it is inherent the command would be a virtual*

command and contain a virtual address since the storage system, as seen by the host,

is a virtual system); translating, in one pass, said logic command to a list of physical

commands (see [0055]), wherein each of said physical commands is targeted to a

different storage device (see [0048]); determining using a check point list the amount of

data to be transferred via a network (see [0081]); wherein said check point list further

defines how data should be sent from an initiator host to said storage devices (see

[0049]-[0050], *the iSCSI and SATA standards define how the data is to be sent across*

the links of the system to the storage devices); executing said physical commands on

said storage devices (see [0087]). Liu fails to disclose scheduling said logic command

for execution. Edsall discloses storing frames that are going to be transmitted to the

storage devices in a queue (see [0059]). Storing the packets in a queue as opposed to directly transmitting them to the storage device allows the storage network to implement a quality of service (see [0059]). It would have been obvious to a person having ordinary skill in the art to which said subject matter pertains to have modified Liu, to include a queue that allows commands to be scheduled and to store the packets that are going to be sent to the storage devices, as disclosed by Edsall, to allow the system to implement a quality of service guarantee.

As per claim 51: said check point list comprises a linked list of data chunks (see [0066]-[0068], *the data is sent in multiple packets, and the packets must be associated with each other to allow the data to be put back together when it is received on the other end*).

As per claim 52: filing at least one data chunk with said data retrieved from the network (see [0066]-[0068], *the data is put into packets to be transmitted*); accessing said storage device using a physical address (see [0081]); writing said data chunk to said accessed storage device (see [0053]); and, repeating said steps for all data chunks in said check point list (*it is inherent that the steps would be repeated until all the data that has been sent out in the packets is written to the storage devices*).

As per claim 53: said physical commands are executed in parallel (see [0048]).

As per claim 54: said physical commands are constructed in a data structure (see [0066]-[0068]).

As per claim 55: said data structure further includes a pointer to said storage

device (see [0051], *the command is parsed and the addresses are translated, therefore*

the physical address would be the pointer to the storage device).

As per claim 56: said alternative command link links between at least two

physical commands that can be executed in parallel (see [0087]-[0088], *the system*

uses a RAID configuration, therefore, it is inherent that there is a data structure that

indicates what commands can be executed in parallel to fully utilize the increased

throughput that a RAID system provides).

As per claim 80: Liu discloses a computer product stored on a computer-

readable medium comprising software instructions operable to enable a computer to

perform a process for performing a plurality of virtualization services, said process being

further operative to perform said virtualization services within a data path, said code

comprises the steps of: receiving a logic command to be performed on at least one

virtual volume, said logic command including at least a virtual address (see [[0044] and

[0051], *it is inherent the command would be a virtual command and contain a virtual*

address since the storage system, as seen by the host, is a virtual system); translating,

in one pass, said logic command to a list of physical commands (see [0055]), wherein

each of said physical commands is targeted to a different storage device (see [0048]);

determining using a check point list the amount of data to be transferred via a network

(see [0081]); wherein said check point list further defines how data should be sent from

an initiator host to said storage devices (see [0049]-[0050], *the iSCSI and SATA*

standards define how the data is to be sent across the links of the system to the storage devices); executing said physical commands on said storage devices (see [0087]). Liu fails to disclose scheduling said logic command for execution. Edsall discloses storing frames that are going to be transmitted to the storage devices in a queue (see [0059]). Storing the packets in a queue as opposed to directly transmitting them to the storage device allows the storage network to implement a quality of service (see [0059]). It would have been obvious to a person having ordinary skill in the art to which said subject matter pertains to have modified Liu, to include a queue that allows commands to be scheduled and to store the packets that are going to be sent to the storage devices, as disclosed by Edsall, to allow the system to implement a quality of service guarantee.

As per claim 81: said check point list comprises a linked list of data chunks (see [0066]-[0068], *the data is sent in multiple packets, and the packets must be associated with each other to allow the data to be put back together when it is received on the other end*).

As per claim 82: filing at least one data chunk with said data retrieved from the network (see [0066]-[0068], *the data is put into packets to be transmitted*); accessing said storage device using a physical address (see [0081]); writing said data chunk to said accessed storage device (see [0053]); and, repeating said steps for all data chunks in said check point list (*it is inherent that the steps would be repeated until all the data that has been sent out in the packets is written to the storage devices*).

As per claim 83: said physical commands are executed in parallel (see [0048]).

As per claim 84: said physical commands are constructed in a data structure

(see [0066]-[0068]).

As per claim 85: said data structure further includes a pointer to said storage

device (see [0051], *the command is parsed and the addresses are translated, therefore*

the physical address would be the pointer to the storage device).

As per claim 86: said alternative command link links between at least two

physical commands that can be executed in parallel (see [0087]-[0088], *the system*

uses a RAID configuration, therefore, it is inherent that there is a data structure that

indicates what commands can be executed in parallel to fully utilize the increased

throughput that a RAID system provides).

Conclusion

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Edward J. Dudek whose telephone number is 571-270-

1030. The examiner can normally be reached on Mon thru Thur 7:30-5:00pm Sec. Fri

7:30-4 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Matthew Kim can be reached on 571-272-4182. The fax phone number for

the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

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USPTO Customer Service Representative or access to the automated information

system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Edward Dudek
June 22, 2007

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